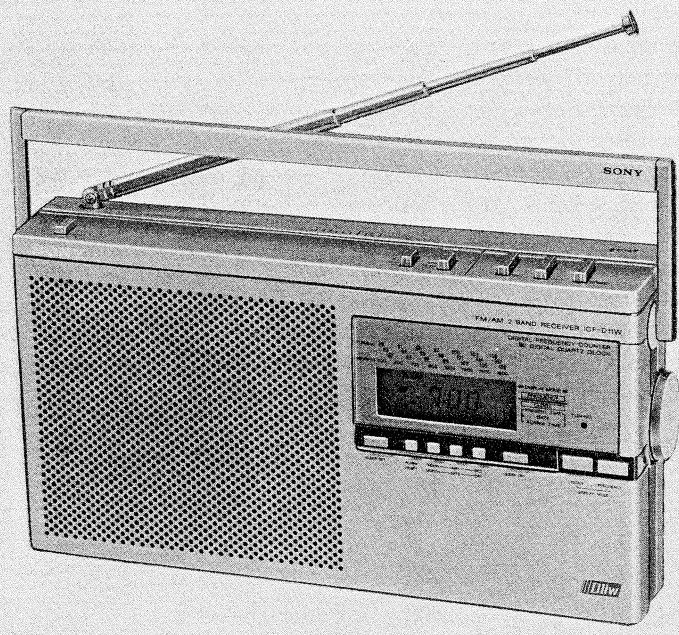
ICF-D11W

US Model
AEP Model
E Model



FM/AM 2 BAND RECEIVER

SPECIFICATIONS

GENERAL

Power Requirements: Clock:
3V dc, two batteries size AA (IEC designation R6)
Radio (including alarm sound, time signal, frequency display and Display Panel light):
3V dc, two batteries size D (IEC designation R20)
120V ac, 60 Hz with Sony AC Power Adaptor AC-31 (optional) (US model)
110, 120, 220 or 240V ac with optional SONY AC Power Adaptor of 3V dc output (AEP, E model)
12V car battery with Sony Car Battery Cord DCC-127A (optional)

Dimensions: Approx. 260 (w) x 140 (h) x 52 (d) mm
$10\frac{1}{4}$ (w) x $5\frac{5}{8}$ (h) x $2\frac{1}{8}$ (d) inches
including projecting parts and controls not including handle

Weight: Approx. 1.4 kg, 3 lb 1 oz
including batteries

RADIO SECTION

Antenna: FM: Telescopic antenna
MW: Built-in ferrite rod antenna

Frequency Range: FM 87.5–108 MHz
MW 530–1,605 kHz

Power Output: 250 mW (at 10% harmonic distortion)

Output Jacks: Recording Jack (minijack)
Earphone Jack (minijack)

Speaker: Approx. 10 cm (4 inches) dia.

CLOCK SECTION

Clock: Liquid crystal digital quartz clock

Accuracy: Within 15 sec. per month at 24°C (76°F)

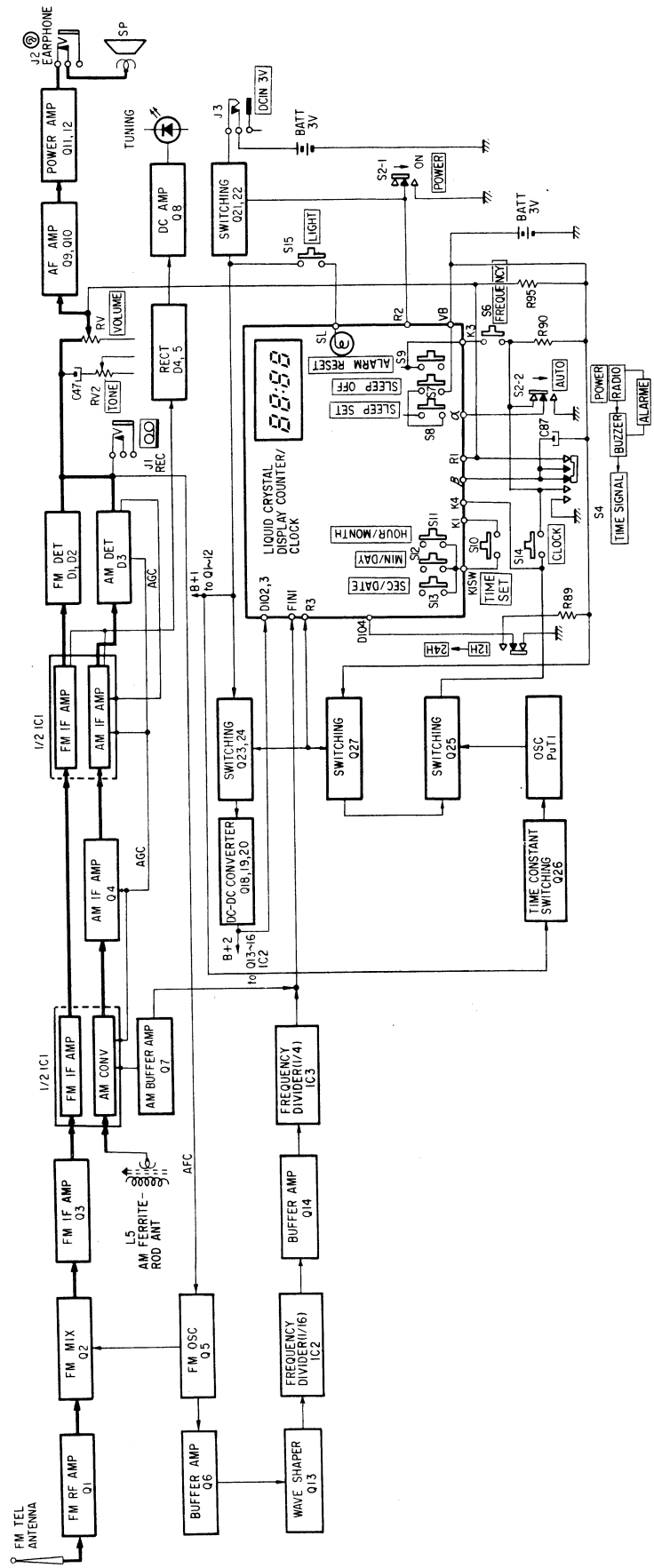
Display Mode: Received frequency (MHz on FM, kHz on MW)
Present-time (hour, minute and second)
Date (month, day and day of week)
Alarm-time (hour and minute)

Time Display Format: 12-hour or 24-hour display, adjustable

SONY®
SERVICE MANUAL

SECTION 1
OUTLINE

1-1. BLOCK DIAGRAM



1-2. FUNCTIONS AND OPERATION

1) Time Display

The time may be displayed in either the 12 or 24 hours system. The day, hour, minute, second, and either AM/PM if the 12 hours system is used, are shown. Time tones are also sounded every hour on the hour. When the 12H/24H selector switch is set to 24H, the same time tones as for the 12H position are generated. The time tone frequency is 512 Hz plus a final tone of 1,024 Hz.

Setting:

The time is displayed when the CLOCK switch is pressed. The correct time may be set by pressing the HOUR, MIN, and SEC switches while depressing the TIME SET switch. When the SEC switch is pressed, the display is set to 00 seconds. If the SEC switch is pressed when the second display reads 0 to 23 seconds, the minute display will remain the same; if the display reads 24 seconds or more the minute display will advance by one. When the HOUR and MIN switches are pressed, the display is advanced by 1 hour and 1 minute respectively. If either switch is depressed and held down, the hour or minute displays will advance at a rate of 1 digit per second.

2) Calendar Display

The month, date, and day may also be displayed. Although this is an automatic calendar, February 29th in leap year must be set manually.

Setting:

Press the CLOCK switch to obtain the calendar display. While keeping the TIME SET switch depressed, press the MONTH, DATE, and DAY switches to set the calendar. Each time these switches are pressed, the display is advanced by 1 month or 1 day respectively. Note that after setting to January 31st, pressing of the MONTH switch will advance the display to February 31st. To advance to February 1st, press the DATE switch. Also note that each display figure is advanced 1 step per second when each switch is depressed and held.

3) Alarm

Once the AUTO switch has been turned on, the radio or a buzzer will turn on at the preset time every 24 hours. This alarm may be switched off by pressing the ALARM RESET switch, but it will still come on again automatically at the same time the next day. If the SLEEP OFF switch is pressed when the radio or buzzer alarm is on, the alarm will shut off for 7 minutes before being turned back on again.

Setting:

Press the CLOCK switch to display the alarm time. Set the desired alarm time by pressing the HOUR and MIN switches while keeping the TIME SET switch depressed. Again, the hour and minute displays will be advanced 1 step per second if each switch remains depressed. When the clock time reaches the alarm time and the alarm is turned on, rapid advancing of the clock time will reduce the time the alarm sounds.

4) Sleep

The radio is turned on when the SLEEP SET switch is pressed. The SLEEP time is reduced by 10 minutes every time the SLEEP SET switch is pressed. And although SLEEP time may be set during any mode, SLEEP time will only be displayed in the time display mode. When the SLEEP SET switch is pressed in this mode, the remaining sleep time in minutes will be displayed.

5) Battery Consumption Alarm

When the clock battery has almost run down, the word ALARM will flash on and off (except when the ALARM time is being displayed).

6) Starting after Battery Replacement

Restart the clock after battery replacement with the following settings:

Mode:	Time display
Time:	AM 12:00○○ SUN
	(no AM, in 24H mode)
Calendar:	1:1 SUN
Alarm time:	AM 1:00 (no AM in 24H mode)

Note: There will be no time tone immediately following battery replacement.

7) Frequency Display

When the FREQUENCY switch is pressed while the radio is on, the frequency of the tuned radio station will be displayed for 30 seconds. This frequency will be in kHz in the AM band, and in MHz in the FM band. Note that although a frequency reading will be displayed briefly if the FREQUENCY switch is pressed after the radio has been turned off, the displayed reading will be unrelated to the tuning dial position.

1-3. CIRCUIT DESCRIPTION

This unit features a liquid crystal digital clock and a frequency counter equipped with a 1-chip microcomputer, and is designed to display tuned frequency, time, calendar, preset alarm, and sleep time.

As the name implies, the microcomputer is an extremely small miniature computer, fully equipped with input/output (I/O), central processing (CPU), and storage (ROM or RAM) facilities, and capable of a variety of very rapid calculations. Programs containing predetermined functions have been written into the ROM, and are maintained securely even when the power supply is cut. A liquid crystal digital display puts fewer demands on the battery than other type displays.

1) When the POWER switch is set to ON

The base of Q22 is connected to ground via S2-1, resulting in both Q22 and Q21 being turned on and power being supplied to the radio section.

2) When the POWER switch is set to AUTO

When the AUTO switch is pressed, the α terminal is connected to ground via S2-2, thereby reducing the α terminal to LOW level and setting the unit in AUTO mode.

When the clock time reaches the set alarm time in AUTO mode, the R2 terminal is set to LOW level, resulting in the radio power being turned on, since Q21 and Q22 are both on. When S4 is in the BUZZER position at this time, a buzzer signal appears at the R1 terminal and is passed via C86, R96, R50, and C48 to the AF amplifier, so that the speaker sounds a buzzer tone with the radio. (If S4 is in the RADIO position, this buzzer signal will be dropped to ground by C87, so no buzzer tone will be heard.)

When S4 is in the TIME SIGNAL position, the β terminal is connected to ground and thereby reduced to LOW level, resulting in time tone signals appearing at R1 exactly on the hour every hour. The number of signals generated corresponds to the hour to a maximum of 12. And since R2 is also at LOW level at this time, the time tones may be heard from the speaker together with the radio.

3) Q25 to Q27

When the FREQUENCY switch is pressed, the clock circuit operates as a frequency counter for a fixed length of time before being switched back automatically to clock operation. This is in order to save power, since the clock circuit operating as a frequency counter consumes considerably more power than the clock operation. After radio station is tuned, the frequency display will be switched back automatically to the clock mode in order to further lengthen battery life.

When the FREQUENCY switch is pressed and the clock operates as a frequency counter, the R3 terminal output is switched over to LOW level and Q27 turned on. At the same time, a voltage is applied to the gate of PUT1, and the anode voltage rises gradually (as determined by the R108, C89, and C90 time constant) until it reaches a certain fixed level where PUT1 is turned on. C89 and C90 thus discharges, and since the PUT1 gate potential also decreases, Q25 is turned on, and the voltage applied to the anode of PUT1 diminishes, resulting in PUT1 being turned off, followed by Q25 also being turned off. Turning Q25 on in this manner has the same effect as pressing the CLOCK switch. If the FREQUENCY switch is pressed and held, the sequence of operations is repeated until the switch is released. After a certain length of time the circuit switches automatically from frequency counter to clock. This fixed time is about 30 seconds when the radio is on, and about 2 seconds when off, and is determined by the switching of the time constant of the PUT1 anode circuit by Q26. (See Fig. 1-1).

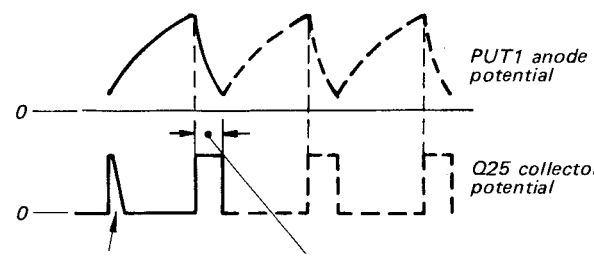

PUT1 anode potential
0
Q25 collector potential
0
This pulse has no effect since it does not appear while the FREQUENCY switch is being pressed.
250–300 m/sec.

Fig. 1-1

4) DC – DC Converter

During AM reception, the clock frequency counter displays a frequency value 455 kHz below the input frequency, while during FM reception 63 MHz is added. The reasons for this are that the local oscillator frequency differs from the received frequency by an amount equal to the intermediate frequency, and that the high FM frequencies are difficult to register accurately on the frequency counter. The frequency displayed on the frequency counter will differ from the received frequency by the amounts indicated above. The circuit involved in reducing the frequencies so that they can be counted more accurately requires a power supply of 5 V, which means that the 3 V supply of this unit has to be stepped up. This 5 V is obtained by using a DC – DC converter, but only when the frequency counter display is used during FM reception.

A diagram of the operating principles of this DC – DC converter is shown in Fig. 1-2. A current I flows through L when S1 is closed, while a voltage is generated across both ends of L when S1 is opened. Since C is charged up by this voltage plus the power supply voltage, the output voltage (the voltage across both ends of C) is increased. This output voltage may be further increased by increasing the time that S1 is on, and shortening the time that it is off. This is because the longer S1 is closed the larger the current will flow through L, thereby increasing the voltage across both ends of C when S1 is opened. The actual circuit employed is diagramed in Fig. 1-3. Q18 corresponds to S1 of Fig. 1-2. Q20 and D11 detect the output voltage, while Q19 controls the time that Q18 is turned on, thereby controlling the output voltage. When there is a drop in the output voltage, the increased current flowing through Q20 and Q19 increases the bias current of Q18, thereby increasing

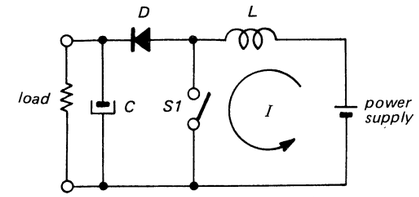


Fig. 1-2

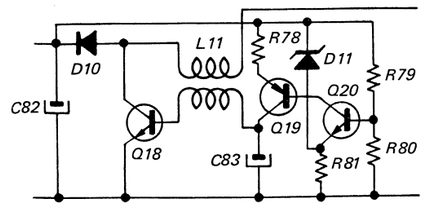


Fig. 1-3

the time that Q18 remains on, and consequently increasing the output voltage. Conversely, the time that Q18 stays on is shortened by the increased output voltage, thereby tending to suppress the output voltage increase.

The oscillation frequency for this circuit is 45 to 50 kHz. The output voltage is determined by R79, R80, R81, and D11.

Since this circuit is only required for FM reception, the input power supply may be controlled by Q23 and Q24. When the clock is operated as a frequency counter, the Q24 base potential is decreased due to the R3 terminal output. During AM reception, however, a B+ potential is applied to the base of Q24 via D12. Consequently, Q23 and Q24 are turned on only when the frequency counter is on during FM reception.

5) Time Setting

Although most inputs for this clock circuit are static inputs, the TIME SET input is a dynamic input. The pulse signal for this dynamic input is obtained from D28, D38, and D48 on the output side of the clock.

6) The three input terminals of DI01 to DI03 are employed for counter presetting. When only the DI02 terminal is set to HIGH level, the counter becomes a upper-heterodyne FM counter with 10.7 MHz intermediate frequency, but when all three terminals are opened, the counter is preset as a MW counter with 455 kHz intermediate frequency.

7) The VB, VM, and VD Terminals

VB terminal: B+ power supply (3.00 V)
VM terminal: Intermediate potential (1.5 V)
VD terminal: B– power supply (connected to ground in this unit)

8) Clock Generator

The clock LSI incorporates a crystal oscillator circuit. Attached to this circuit is a crystal (f_{TYP} = 32,768 Hz).

9) ACL Terminal

The insertion of a capacitor between this "power-on clear" terminal and the VB terminal permits the circuit to be started from the prescribed time after battery replacement.

10) BA Terminal

The low voltage detector circuit is operated with a variable resistor inserted between the BA and VD terminals. The alarm voltage level is varied by changing the resistance of the variable resistor. When the voltage drops to a certain level, the word "ALARM" is flashed on and off. (The voltage setting for this unit is 2.5–2.8 V).

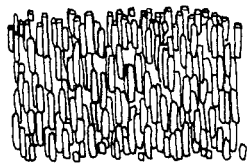
1-4. LIQUID CRYSTAL DISPLAY

Liquid crystals are endowed with both liquid and crystalline natures. Although they appear to be a liquid, the molecular arrangement is that of a crystal. When a liquid crystal is inserted between 2 glass plates, the molecules align in a single fixed direction and become transparent. This direction is determined by the nature of the glass plate, the surface condition, and a number of other factors which are decided at the time of manufacture. The liquid crystal employed in the display of this unit has been designed to align the crystals parallel with the surface of the glass plates. When liquid crystal is inserted between 2 plates of identical glass arranged with their major axes at right angles to each other (in the same parallel plane), the crystal alignment is gradually shifted through 90° from one plate of glass to the other. When light is passed through such a layer, the plane of polarization of the light is twisted through the same 90°. By incorporating transparent electrodes in both plates of glass and applying a voltage across them, the liquid crystal molecules between the electrodes will be re-aligned in the direction of the electric field, that is, perpendicular to the glass plates. Consequently, light passing through the liquid crystal at these positions will not be subject to any polarization. Liquid crystal displays utilize these properties, and employ deflector and reflector plates in their construction.

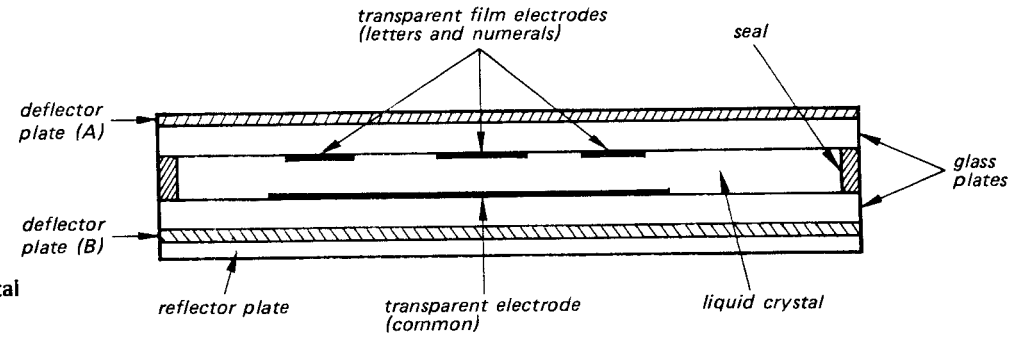
Deterioration of the liquid crystals result in loss of contrast and the generation of air bubbles. The electrodes also tend to darken. However, deterioration of the liquid crystal itself is practically unknown – defects tend to occur more readily in the deflector and other parts which are susceptible to high temperatures, humidity, and ultra violet light. After liquid crystals have been used for a long time, there is normally a certain amount of darkening. In order to prevent molecular destruction from ultra violet light, sometimes yellow filters are employed, but these reduce the degree of clarity. The liquid crystals employed in this unit is relatively resistant to the effects of ultra violet light, and consequently does not require such a cover.

Liquid Crystal Display Advantages:

- Very small power consumption (a dry battery can drive a display continuously for about a year).
- Since liquid crystal displays employ reflected light, good contrast is achieved even under bright conditions.
- Does not cause eye fatigue.

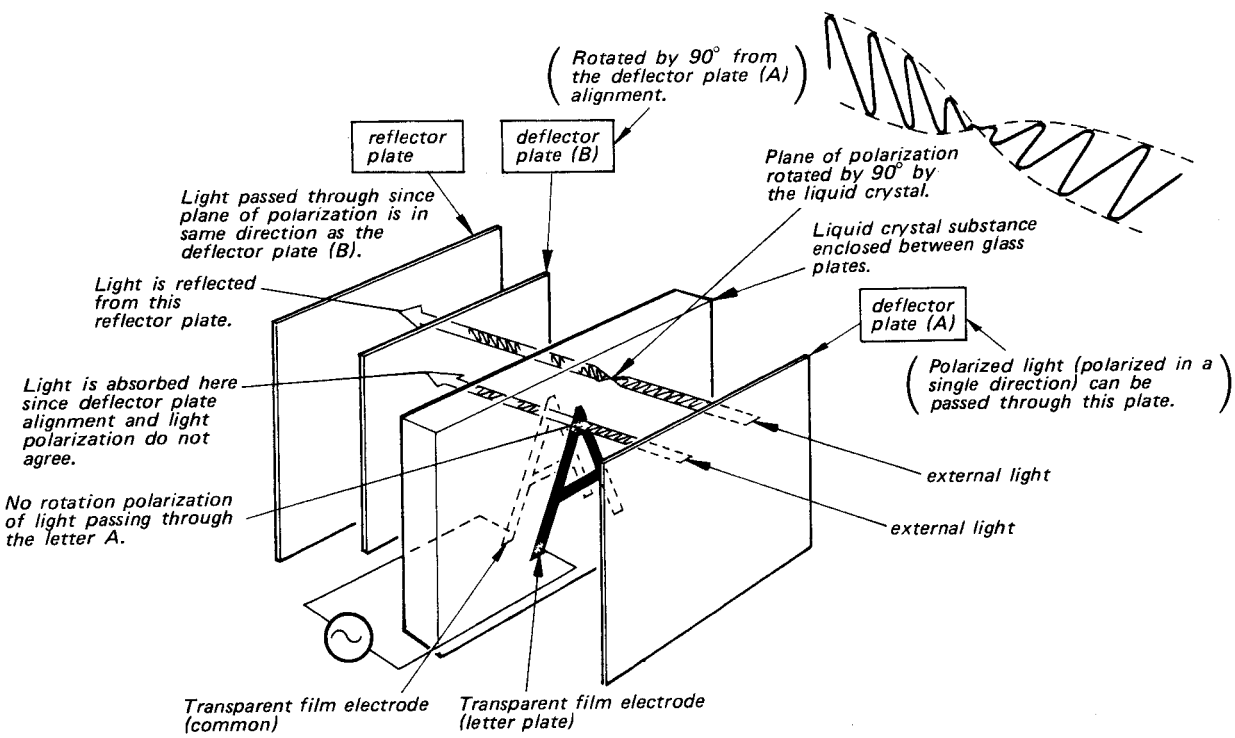


Example of Liquid Crystal Molecular Alignment (Nematic Phase)



Cross Section of Display Plate

Liquid crystal enclosed between glass plates has become transparent since the crystal molecules have all been aligned in the same direction.


Rotated by 90° from the deflector plate (A) alignment.
reflector plate
deflector plate (B)
Plane of polarization rotated by 90° by the liquid crystal.
Light passed through since plane of polarization is in same direction as the deflector plate (B).
Liquid crystal substance enclosed between glass plates.
Light is reflected from this reflector plate.
deflector plate (A)
Polarized light (polarized in a single direction) can be passed through this plate.
Light is absorbed here since deflector plate alignment and light polarization do not agree.
external light
No rotation polarization of light passing through the letter A.
external light
Transparent film electrode (common)
Transparent film electrode (letter plate)

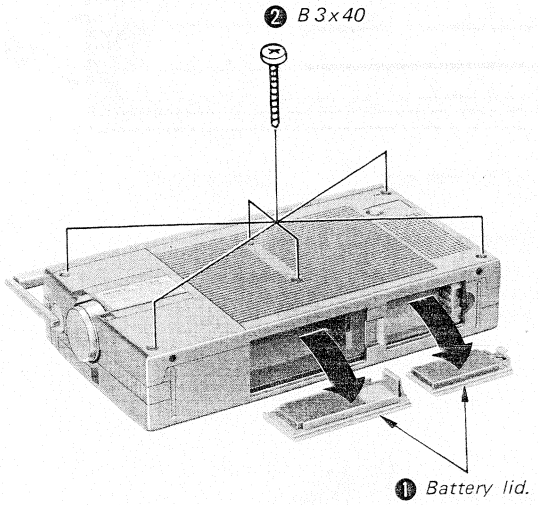
Outline of the Operational Principles Involved in the Liquid Crystal Display

SECTION 2
DISASSEMBLY

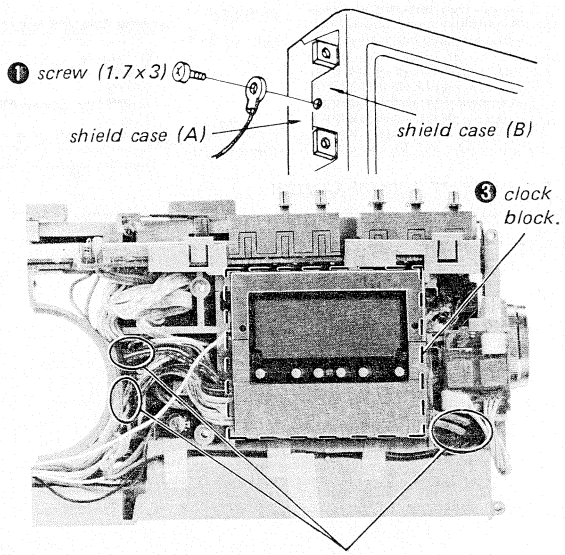
2-1. REMOVAL

Note: Follow the disassembly procedure in the numerical order given.

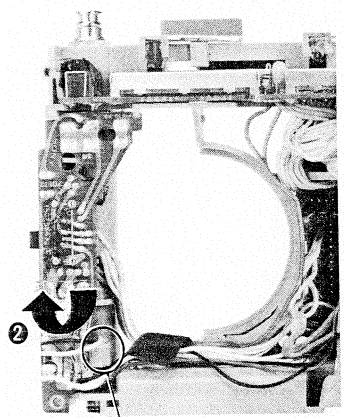
FRONT CABINET, REAR CABINET



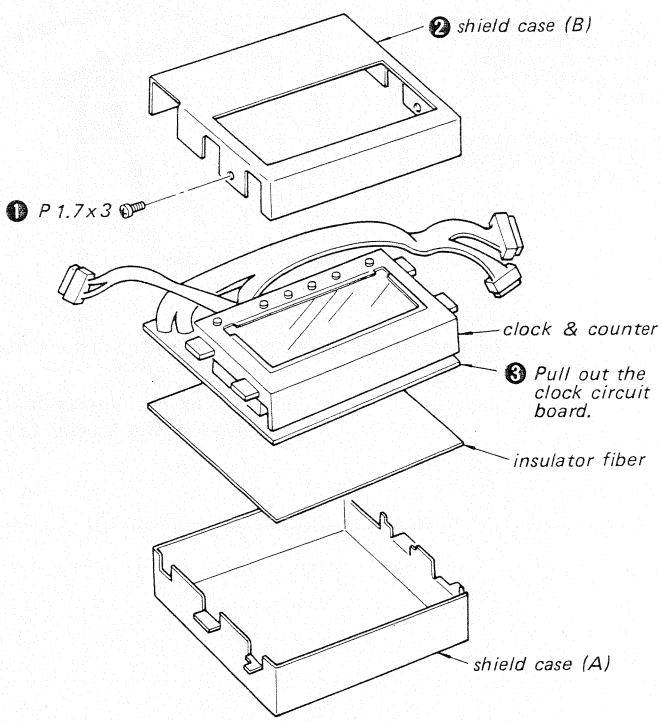
CLOCK BLOCK



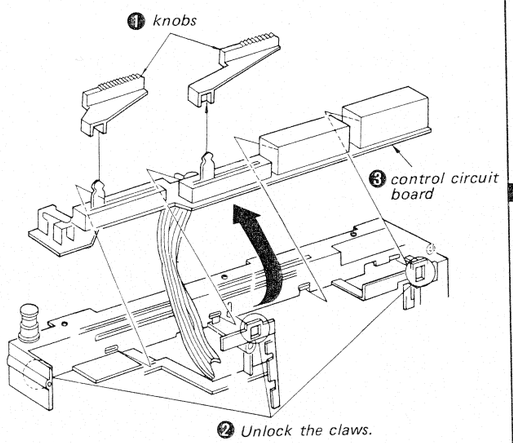
JACK CIRCUIT BOARD



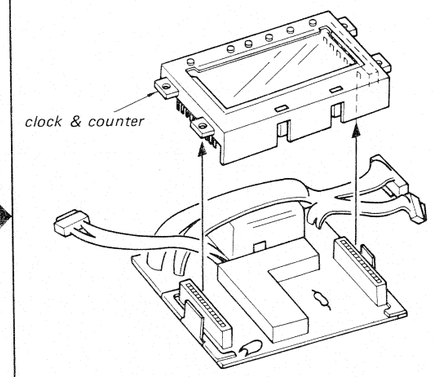
CLOCK CIRCUIT BOARD



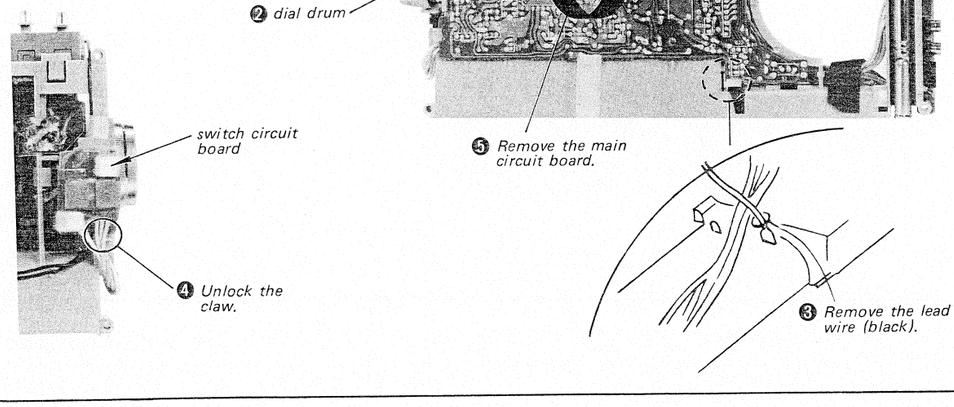
CONTROL CIRCUIT BOARD



CLOCK & COUNTER

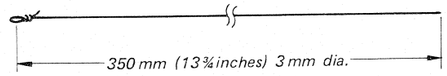


MAIN CIRCUIT BOARD

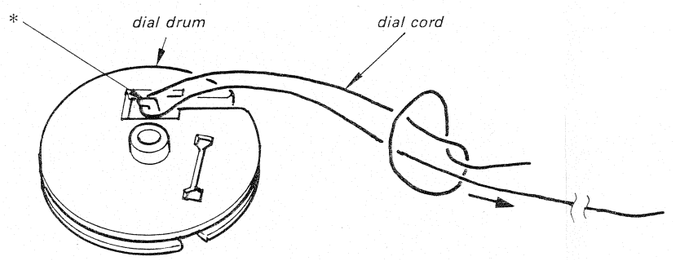

❶ screw (1.7x3)
❷ dial drum
switch circuit board
❹ Unlock the claw.
❺ Remove the main circuit board.
❸ Remove the lead wire (black).

2-2. DIAL CORD STRINGING

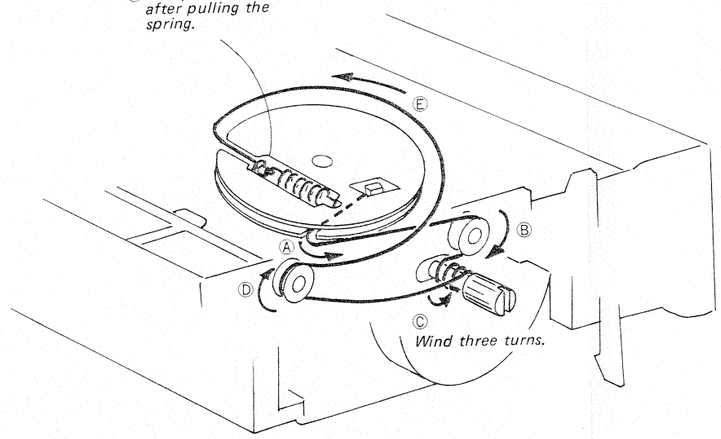
1. Dial Cord Preparation



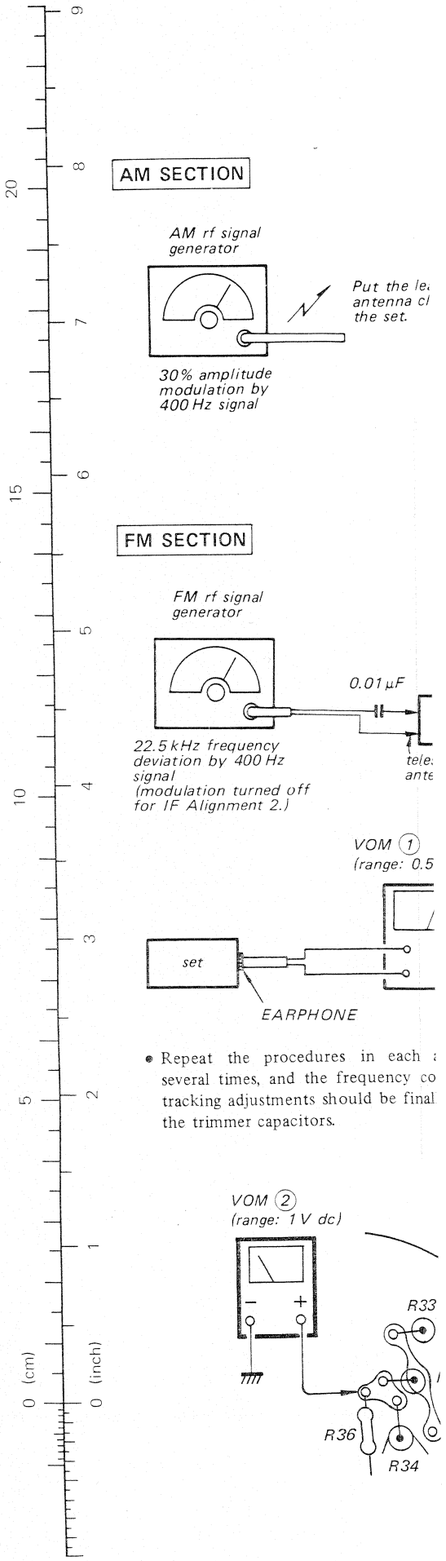
2. Dial Cord Stringing



❶ Tie the dial cord to the portion * of the dial drum.



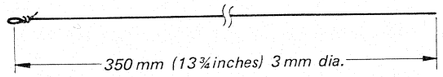
❷ Turn the dial drum fully counterclockwise.
❸ Proceed in the order Ⓐ–Ⓕ.
❹ Apply a small amount of contact cement to the knot.



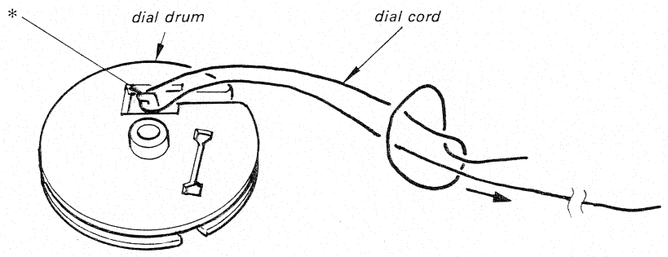
• Repeat the procedures in each s several times, and the frequency co tracking adjustments should be final the trimmer capacitors.

2-2. DIAL CORD STRINGING

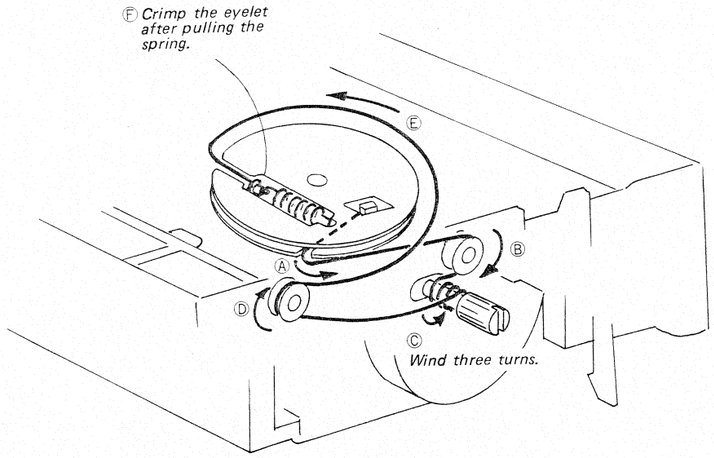
1. Dial Cord Preparation



2. Dial Cord Stringing

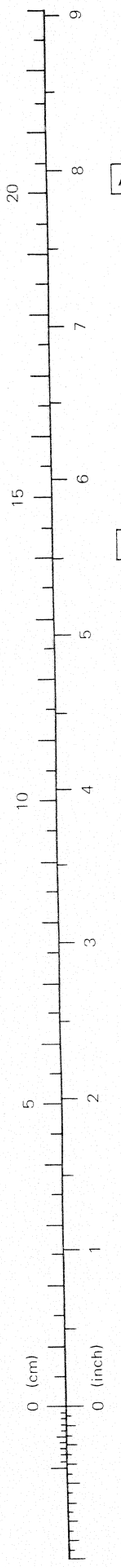


❶ *Tie the dial cord to the portion * of the dial drum.*

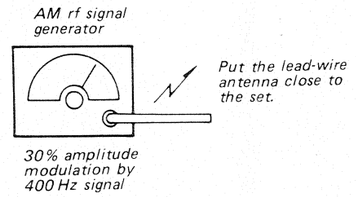


❷ *Turn the dial drum fully counterclockwise.*
❸ *Proceed in the order Ⓐ–Ⓕ.*
❹ *Apply a small amount of contact cement to the knot.*

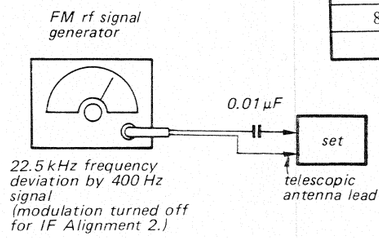
SECTION 3
ELECTRICAL ADJUSTMENTS

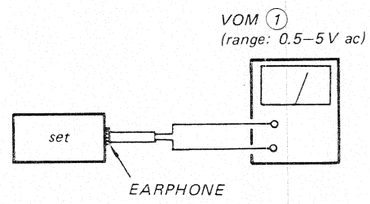


AM SECTION

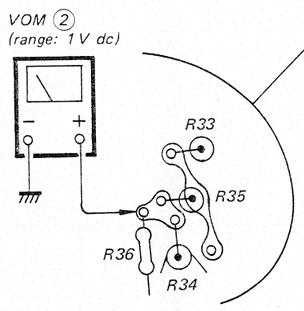


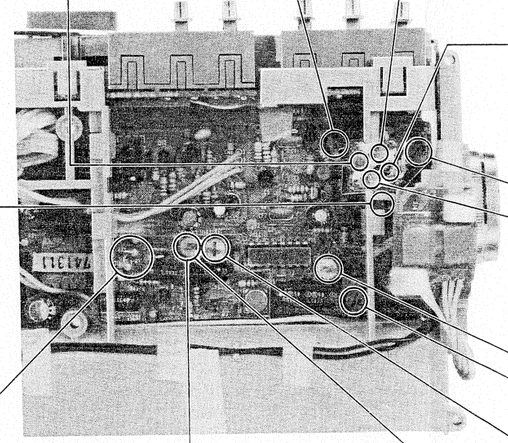
FM SECTION

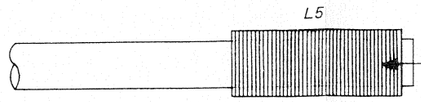

FM rf signal generator
0.01 µF
set
22.5 kHz frequency deviation by 400 Hz signal (modulation turned off for IF Alignment 2.)
telescopic antenna lead



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.







FM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
87.1 MHz	108.5 MHz
L4	CT2

FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
87.1 MHz	108.5 MHz
L1	CT1

AM TRACKING ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
L5	600 kHz
CT3	1,400 kHz

AM FREQUENCY COVERAGE ADJUSTMENT	
Adjust for a maximum reading on VOM ①.	
L6	520 kHz
CT4	1,650 kHz

AM IF ALIGNMENT	
Adjust for a maximum reading on VOM ①.	
IFT A1	455 kHz
IFT A2	

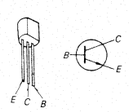
IFT F2
Adjust for 0 V reading on VOM ②.
FM IF ALIGNMENT 2 (10.7 MHz with no modulation)

IFT F2	IFT F1
10.7 MHz	
Adjust for a maximum reading on VOM ①.	
FM IF ALIGNMENT 1	

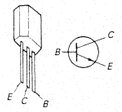
Replacement Semiconductors

For replacement, use semiconductors except in ( ).

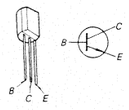
Q1–4, Q7, 14 : 2SC930
Q8–10, Q20, 26 : 2SC1364 (2SC1633)
Q11, 12: 2SC1475 (2SC1209)
Q14: 2SC930
Q18: 2SC1474



2SC1364

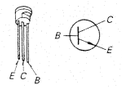


2SC1633

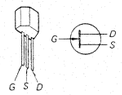


2SC1209

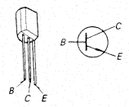
Q5: 2SC668



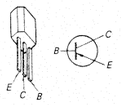
Q6: 2SK42-2 (2SK42)



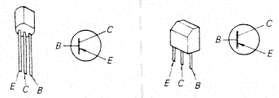
Q13: 2SC710-15 (2SC1908)



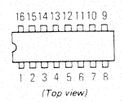
Q19, 22, 24, Q25, 27 : 2SA1027R (2SA733)



Q21, 23: 2SA772-23 (2SB564)



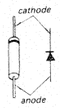
IC1: μPC1018C



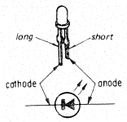
IC2: μPC553C

IC3: SN74LS74N

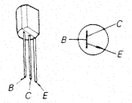
D1, 2, 4, 5: 1T261 (1T262)
D3: 1T22AM (1T23)
D8, 14–18: 1S1555
D10, 12, 13: 1S1555 (1S2076)
D11: RD3.6E-BZ8



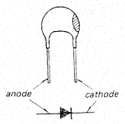
D6: SLP131B



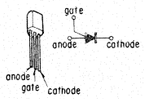
D7: 2SC710-15



D9: VD1121



PUT1: N13T1



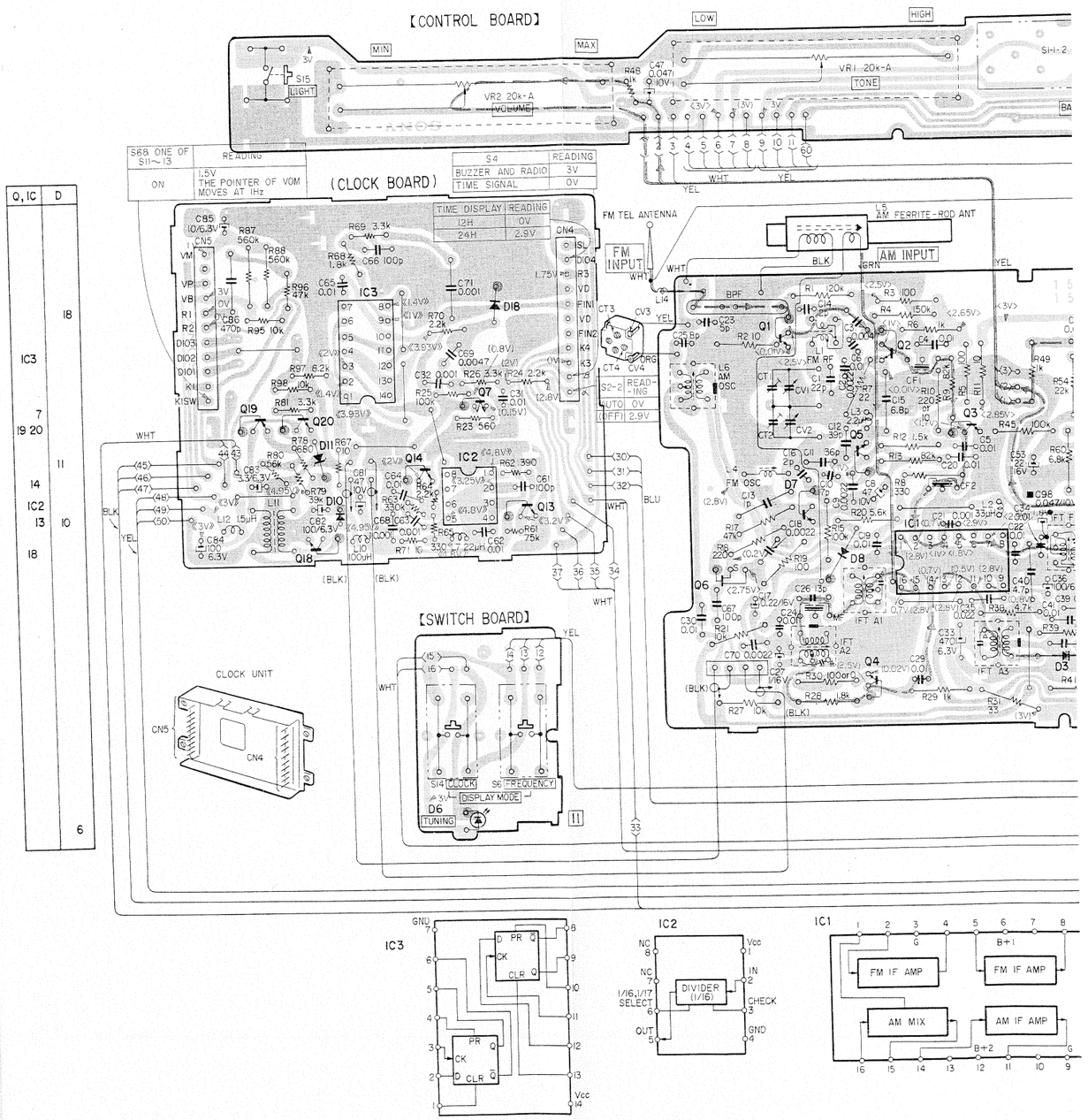
Note: (for Mounting Diagram)

- ○—: parts extracted from the component side.
- ●—: parts extracted from the conductor side.
- ■: part mounted on the conductor side.
- [ ]—: indicates side identified with part number.
- ▨: B+ pattern
- ▬▬▶: signal path
- Readings are taken under no-signal (detuned) conditions with a VOM (20 kΩ/V).
  〈 〉: FM
  《 》: FM frequency is displayed
  ( ): AM

SECTION 4
DIAGRAMS

4-1. MOUNTING DIAGRAM

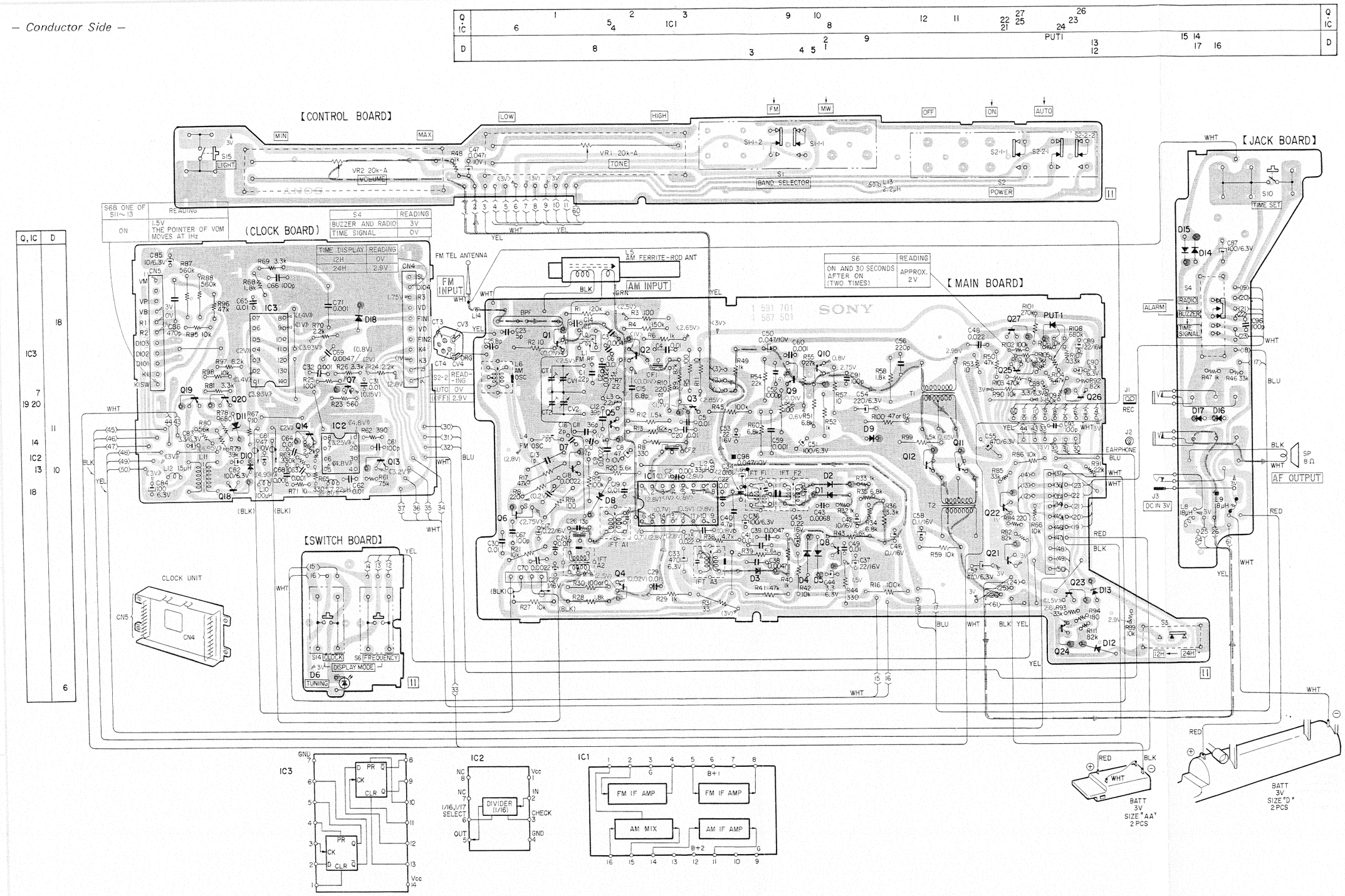
— Conductor Side —



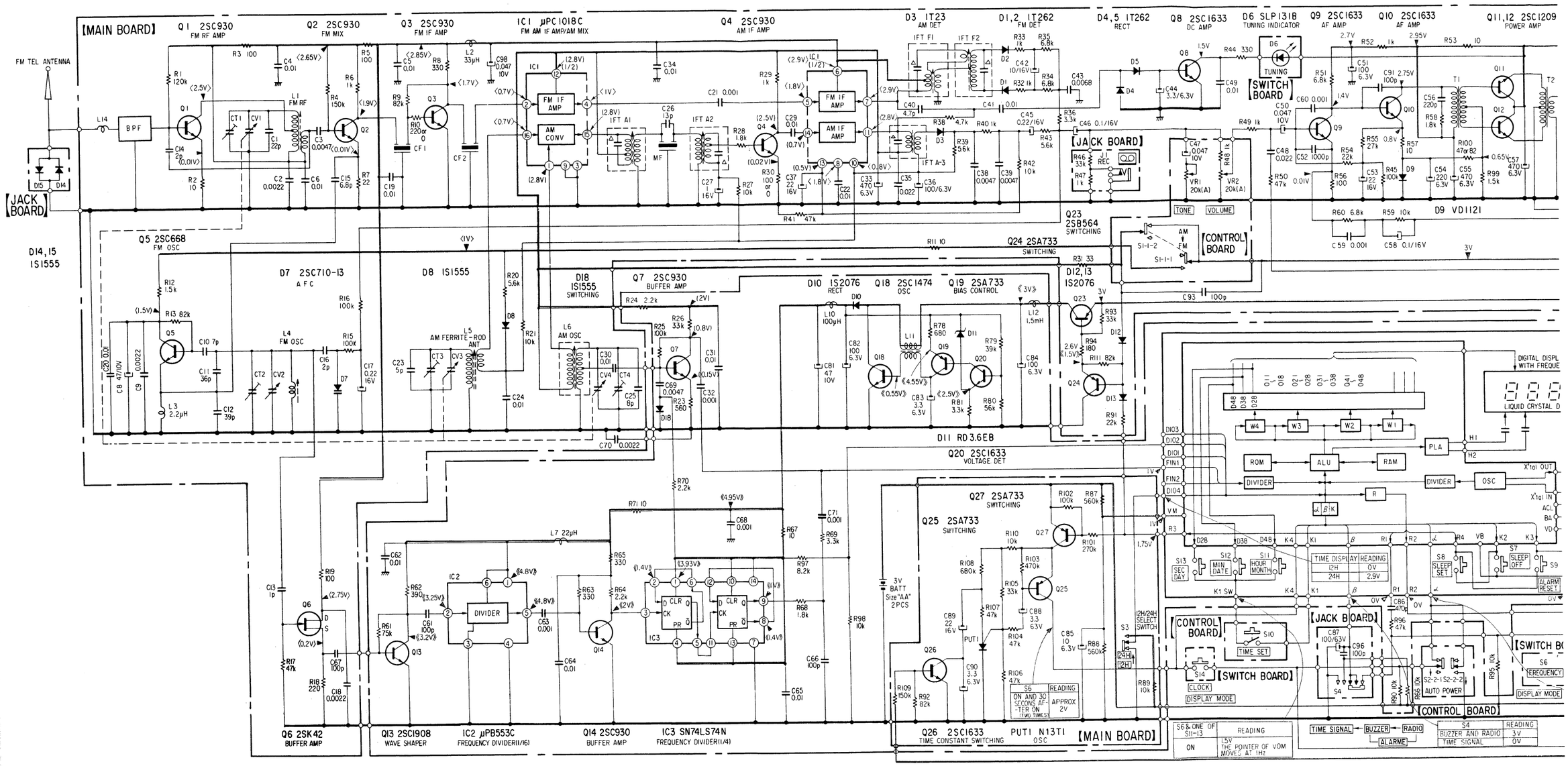
SECTION 4
DIAGRAMS

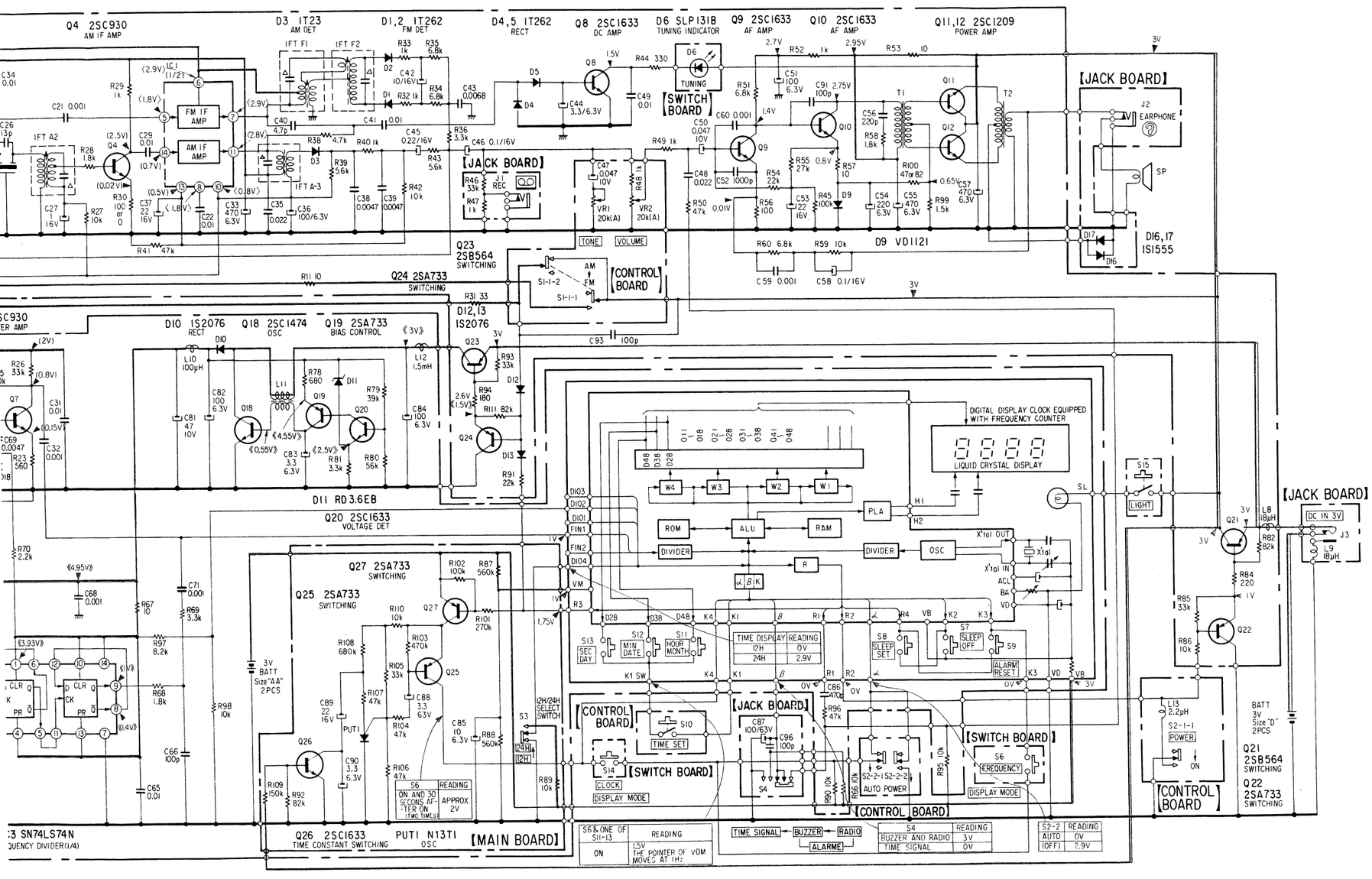
4-1. MOUNTING DIAGRAM

– Conductor Side –



4-2. SCHEMATIC DIAGRAM





Note: (for Schematic Diagrams)

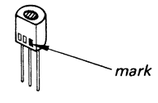
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics.
- All resistors are in ohms, ¼W unless otherwise noted. kΩ: 1000Ω; MΩ: 1000kΩ
- △ : internal component.
- Readings are taken under no-signal (detuned) conditions with a VOM (20kΩ/V).
  〈 〉: FM
  《 》: FM frequency is displayed
  ( ): AM
- ▭ : panel designation.
- When either Q11 or Q12 is defective, replace both Q11 and Q12 (2SC1475) and adjust R100 to obtain 6–7mA idling current.
- Switch

Ref. No.	Switch	Position
S1	BAND SELECTOR	FM
S2	POWER	OFF
S3	24H/12H	12H
S4	ALARM/RADIO/BUZZER/ TIME SIGNAL	RADIO
S6	DISPLAY MODE (FREQUENCY)	OFF
S7	SLEEP OFF	OFF
S8	SLEEP SET	OFF
S9	ALARM RESET	OFF
S10	TIME SET	OFF
S11	HOUR, MONTH	OFF
S12	MIN, DATE	OFF
S13	SEC, DAY	OFF
S14	DISPLAY MODE (CLOCK)	OFF
S15	LIGHT	OFF

IC1	R30
μPC1018C-E μPC1018C-C	100Ω
μPC1018C-F μPC1018C-D	short

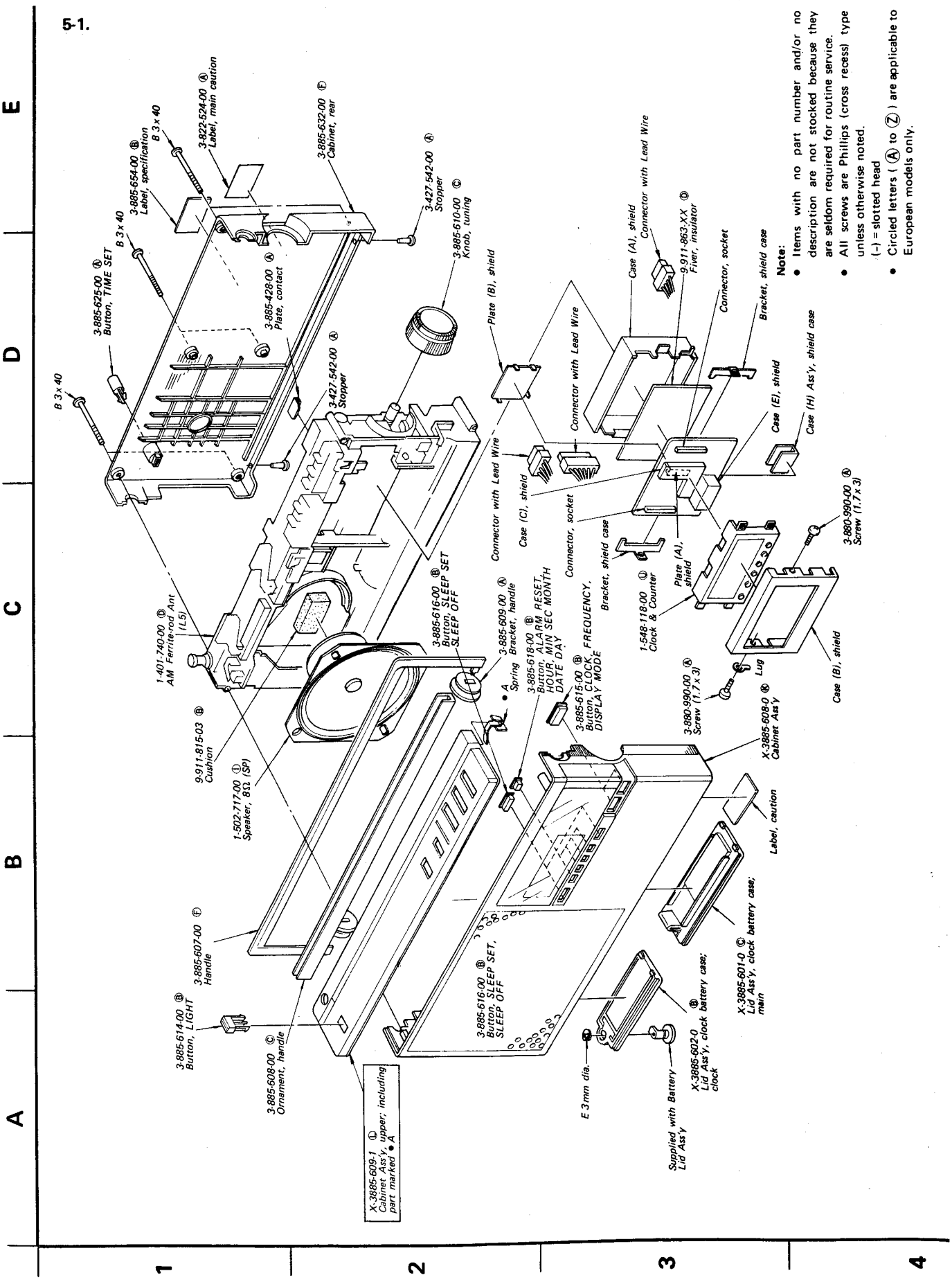
IC1	R10
μPC1018C-E μPC1018C-F	short
μPC1018C-C μPC1018C-D	220Ω

MARK	Q11, 12	R100
C2	2SC1209-4	47Ω
D1	2SC1209-5	82Ω

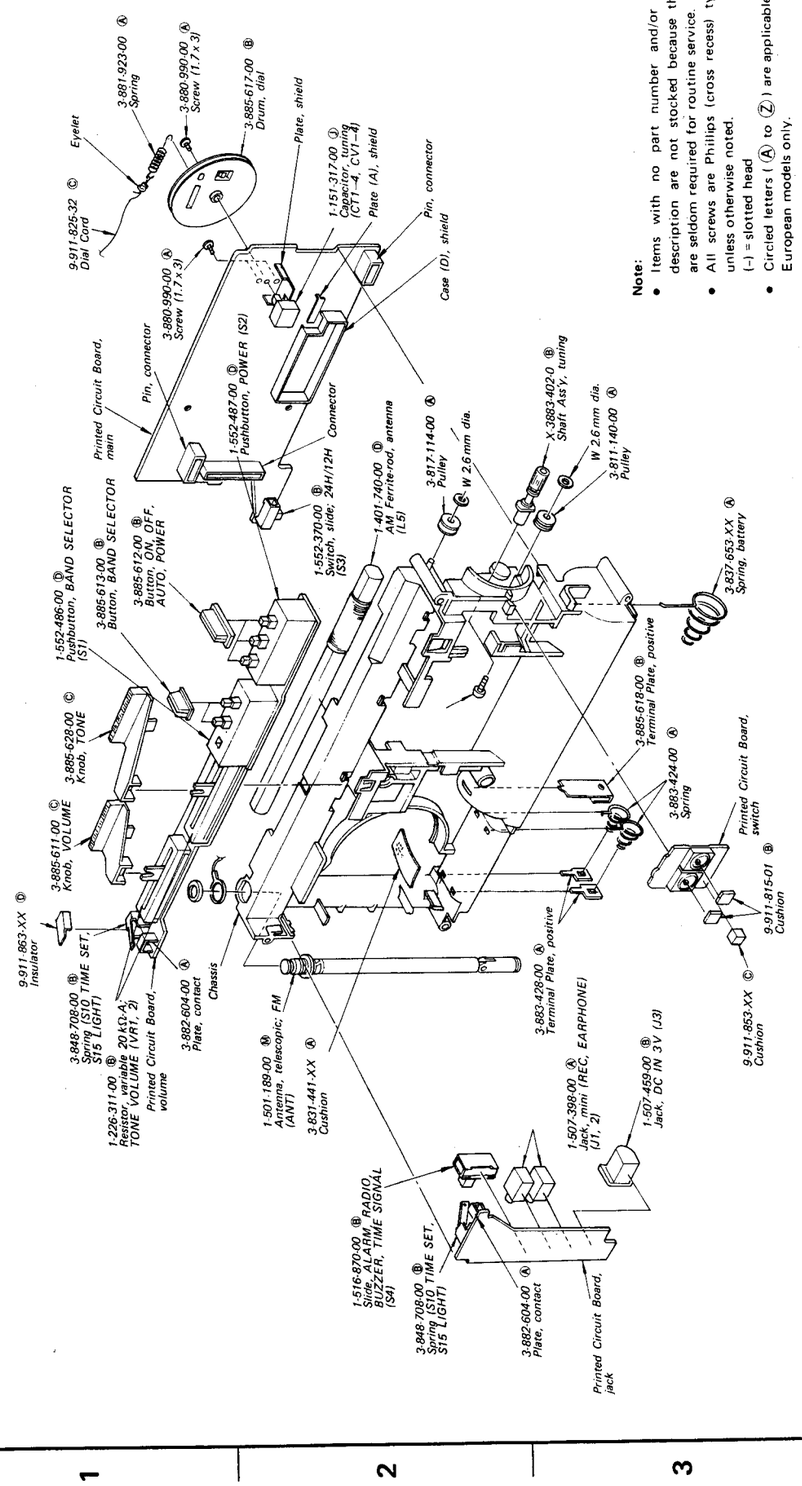


SECTION 5
EXPLODED VIEWS

5-1.


3-822-524-00 Ⓐ Label, main caution
3-885-632-00 Ⓕ Cabinet, rear
3-885-654-00 Ⓑ Label, specification
B 3x40
3-427-542-00 Ⓐ Stopper
3-885-610-00 Ⓒ Knob, tuning
3-885-625-00 Ⓐ Button, TIME SET
3-885-428-00 Ⓐ Plate, contact
3-427-542-00 Ⓐ Stopper
Plate (B), shield
Case (A), shield
Connector with Lead Wire
9-911-963-XX Ⓒ Fiver, insulator
Connector, socket
Bracket, shield case
Note:
• Items with no part number and/or no description are not stocked because they are seldom required for routine service.
• All screws are Philips (cross recess) type unless otherwise noted.
(-) = slotted head
• Circled letters (Ⓐ to Ⓩ) are applicable to European models only.
Connector with Lead Wire
Case (C), shield
Connector, socket
Case (E), shield
Case (H) Ass'y, shield case
3-880-990-00 Ⓐ Screw (1.7x3)
1-401-740-00 Ⓑ AM Ferrite-rod Ant (LS)
3-885-616-00 Ⓑ Button, SLEEP SET SLEEP OFF
3-885-609-00 Ⓐ Bracket, handle
Bracket, shield case
1-548-118-00 Ⓓ Clock & Counter
Plate (A), shield
3-885-618-00 Ⓑ Button, ALARM RESET HOUR, MIN SEC MONTH DATE DAY
3-885-615-00 Ⓑ Button, CLOCK FREQUENCY, DISPLAY MODE
9-911-815-03 Ⓑ Cushion
1-502-717-00 Ⓘ Speaker, 8Ω (SP)
• A Spring
3-880-990-00 Ⓐ Screw (1.7x3)
Lug
Case (B), shield
X-3885-608-0 Ⓚ Cabinet Ass'y
Label, caution
3-885-607-00 Ⓕ Handle
3-885-614-00 Ⓑ Button, LIGHT
3-885-608-00 Ⓒ Ornament, handle
3-885-616-00 Ⓑ Button, SLEEP SET, SLEEP OFF
E 3mm dia.
X-3885-601-0 Ⓒ Lid Ass'y, clock battery case; main
Ⓑ
X-3885-602-0 Lid Ass'y, clock battery case; clock
Supplied with Battery Lid Ass'y
X-3885-609-1 Ⓓ Cabinet Ass'y, upper; including part marked • A
A
B
C
D
E
1
2
3
4

5-2.



Note:
- Items with no part number and/or no description are not stocked because they are seldom required for routine service.
- All screws are Phillips (cross recess) type unless otherwise noted.
  (-) = slotted head
- Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

SECTION 6
ELECTRICAL PARTS LIST

Ref. No.	*Part No.*	*Description*
		SEMICONDUCTORS
		Transistors
Q1–4	8-729-803-04	Ⓑ 2SC930
Q5	8-729-806-84	Ⓑ 2SC668
⇒ Q6	8-727-312-00	Ⓒ 2SK42-2
Q7	8-729-803-04	Ⓑ 2SC930
⇒ Q8–10	8-729-663-47	Ⓒ 2SC1364
⇒ Q11,12	8-760-413-10	Ⓑ 2SC1475
⇒ Q13	8-729-671-15	Ⓑ 2SC710-15
Q14	8-729-803-04	Ⓑ 2SC930
Q18	8-760-335-10	Ⓑ 2SC1474
⇒ Q19	8-729-612-77	Ⓑ 2SA1027R
⇒ Q20	8-729-663-47	Ⓒ 2SC1364
⇒ Q21	8-760-523-10	Ⓒ 2SA772-23
⇒ Q22	8-729-612-77	Ⓑ 2SA1027R
⇒ Q23	8-760-523-10	Ⓒ 2SA772-23
⇒ Q24,25	8-729-612-77	Ⓑ 2SA1027R
⇒ Q26	8-729-663-47	Ⓒ 2SC1364
⇒ Q27	8-729-612-77	Ⓑ 2SA1027R
		ICs
IC1	8-759-110-15	Ⓐ μPC1018C
IC2	8-759-105-53	Ⓚ μPC553C
IC3	8-759-900-74	Ⓓ SN74LS74N
		Diodes
⇒ D1,2	8-719-026-11	Ⓐ 1T261
⇒ D3	8-719-422-21	Ⓑ 1T22AM
⇒ D4,5	8-719-026-11	Ⓐ 1T261
D6	8-719-901-31	Ⓑ SLP131B
D7	8-729-671-13	Ⓑ 2SC710-13
D8	8-719-815-55	Ⓑ 1S1555
D9	8-719-112-11	Ⓐ VD1121
⇒ D10	8-719-815-55	Ⓑ 1S1555
D11	8-719-136-17	Ⓑ RD3.6E-BZ8
⇒ D12,13	8-719-815-55	Ⓑ 1S1555
D14–18	8-719-815-55	Ⓑ 1S1555
PUT1	8-729-101-31	Ⓑ N13T1

⇒: Due to standardization, interchangeable replacements may be substituted for parts specified in the diagrams.

Ref. No.	*Part No.*	*Description*
		COILS
L1	1-425-632-00	Ⓑ FM-RF Transformer
L2	1-407-163-XX	Ⓐ Microinductor, 33 μH
L3	1-407-182-XX	Ⓐ Microinductor, 2.2 μH
L4	1-405-738-00	Ⓑ FM OSC
L5	1-401-740-00	Ⓓ AM Ferrite-rod, antenna
L6	1-405-685-00	Ⓑ MW OSC
L10	1-407-169-XX	Ⓐ 100 mH, LF-1 microinductor
L11	1-404-140-00	Ⓒ Converter, transformer
L12	1-407-856-00	Ⓒ Choke, power; 1.5 mH
L13	1-407-182-XX	Ⓐ 2.2 μH, microinductor
		TRANSFORMERS
IFT A1	1-409-323-00	Ⓑ Mechanical Filter
IFT A2	1-409-324-00	Ⓑ Mechanical Filter
IFT A3	1-404-100-00	Ⓑ IFT
IFT F1	1-404-144-00	Ⓑ FM Discriminator
IFT F2	1-403-953-00	Ⓑ FM Discriminator
T1	1-423-204-XX	Ⓒ INPUT
T2	1-427-413-00	Ⓑ OUTPUT

CAPACITORS

All capacitors are in μF and ceramic unless otherwise noted.
50WV or less are not indicated except for electrolytics. p: μμF, elect: electrolytic

C1	1-102-959-00	Ⓐ 22p		
C2	1-102-121-00	Ⓐ 0.0022		
C3	1-101-003-00	Ⓐ 0.0047		
C4–6	1-161-032-00	Ⓐ 0.01		semiconductor
C8	1-121-352-00	Ⓐ 47	10V	elect
C9	1-102-121-00	Ⓐ 0.0022		
C10	1-102-944-00	Ⓐ 7p		
C11	1-102-646-00	Ⓐ 36p		
C13	1-161-247-00	Ⓐ 1p		
C14	1-102-935-00	Ⓐ 2p		
C15	1-161-257-00	Ⓐ 6.8p		

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	Part No.	Description		
C16	1-102-935-00	Ⓐ 2p		
C17	1-131-453-00	Ⓐ 0.22	16V	elect
C18	1-102-121-00	Ⓐ 0.0022		
C19	1-161-032-00	Ⓐ 0.01		semiconductor
C20	1-101-004-00	Ⓐ 0.01		
C21	1-101-001-00	Ⓐ 0.001		
C22	1-161-032-00	Ⓐ 0.01		semiconductor
C23	1-102-807-00	Ⓐ 5p		
C24	1-161-032-00	Ⓐ 0.01		
C25	1-102-250-00	Ⓑ 8p		
C26	1-102-950-00	Ⓐ 13p		
C27	1-131-457-00	Ⓑ 1.0	16V	elect
C29	1-161-032-00	Ⓐ 0.01		semiconductor
C30	1-101-004-00	Ⓐ 0.01		
C31	1-161-032-00	Ⓐ 0.01	25V	semiconductor
C32	1-101-001-00	Ⓐ 0.001		
C33	1-121-424-00	Ⓑ 470	6.3V	elect
C34	1-161-032-00	Ⓐ 0.01		semiconductor
C36	1-123-295-00	Ⓐ 100	6.3V	elect
C37	1-121-479-00	Ⓐ 22	16V	elect
C38,39	1-161-030-00	Ⓐ 0.0047		semiconductor
C40	1-161-255-00	Ⓐ 4.7p		
C41	1-101-004-00	Ⓐ 0.01		
C42	1-121-651-00	Ⓐ 10	16V	elect
C43	1-161-031-00	Ⓐ 0.0068		semiconductor
C44	1-131-460-00	Ⓑ 3.3	6.3V	elect
C45	1-131-453-00	Ⓐ 0.22	16V	elect
C46	1-131-451-00	Ⓐ 0.1	16V	elect
C47	1-127-018-00	Ⓑ 0.047	16V	elect
C48	1-101-005-00	Ⓐ 0.022		
C49	1-161-032-00	A 0.01		semiconductor
C50	1-127-018-00	Ⓑ 0.047	16V	elect
C51	1-121-413-00	Ⓐ 100	6.3V	elect
C53	1-121-479-00	Ⓐ 22	16V	elect
C54	1-121-419-00	Ⓑ 220	6.3V	elect
C55	1-121-424-00	Ⓑ 470	6.3V	elect
C56	1-102-110-00	Ⓐ 220p		
C57	1-121-424-00	Ⓑ 470	6.3V	elect
C58	1-131-451-00	Ⓐ 0.1	16V	elect
C59	1-161-323-00	Ⓐ 0.01		

Ref. No.	Part No.	Description		
C60	1-102-074-00	Ⓐ 0.001		
C61	1-102-973-00	Ⓐ 100p		
C62	1-101-004-00	Ⓐ 0.01		
C63	1-101-001-00	Ⓐ 0.001		
C64,65	1-101-004-00	Ⓐ 0.01		
C66,67	1-102-973-00	Ⓐ 100p		
C68	1-161-323-00	Ⓐ 0.001		
C69	1-101-003-00	Ⓐ 0.0047		
C70	1-101-002-00	Ⓐ 0.0022		semiconductor
C71	1-161-323-00	Ⓐ 0.001		
C81	1-121-352-00	Ⓐ 47	10V	elect
C82	1-123-295-00	Ⓐ 100	6.3V	elect
C83	1-131-460-00	Ⓑ 3.3	6.3V	elect
C84	1-123-295-00	Ⓐ 100	6.3V	elect
C85	1-131-228-00	Ⓑ 10	6.3V	elect
C86	1-161-319-00	Ⓐ 470p		
C87	1-123-295-00	Ⓐ 100	6.3V	elect
C88	1-131-460-00	Ⓑ 3.3	6.3V	elect
C89	1-121-479-00	Ⓐ 22	16V	elect
C90	1-131-460-00	Ⓑ 3.3	6.3V	elect
C91	1-102-973-00	Ⓐ 100p		
C96	1-102-973-00	Ⓐ 100p		
C98	1-127-018-00	Ⓑ 0.047	16V	elect
CT1–4, CV1–4	1-151-317-00	Ⓙ Tuning		

RESISTORS

All resistors are in ohms. Common ¼W carbon resistors are omitted.
Check schematic diagram for values.

R23	1-201-872-00	Ⓐ 560	1/8W	composition
R24	1-201-863-00	Ⓐ 2.2	1/8W	composition
R25	1-201-868-00	Ⓑ 100	1/8W	composition
R26	1-246-485-00	Ⓐ 3.3	1/8W	composition
R63	1-247-047-00	Ⓐ 330 k	1/8W	
R64	1-246-789-00	Ⓐ 2.2 k	1/8W	
R65	1-246-777-00	Ⓐ 330	1/8W	
R68	1-201-649-00	Ⓐ 1.8 k	1/8W	composition

Note: Circled letters (Ⓐ to Ⓩ) are applicable to European models only.

Ref. No.	*Part No.*		*Description*		
R69	1-202-013-00	Ⓐ	3.3 k	1/8W	composition
R78	1-246-781-00	Ⓐ	680	1/8W	
R79	1-214-170-00	Ⓐ	39 k		metal oxide
R80	1-214-174-00	Ⓐ	56 k		metal oxide
R81	1-246-789-00	Ⓐ	3.3 k	1/8W	
R95	1-201-865-00	Ⓑ	10 k	1/8W	composition
R96	1-202-078-00	Ⓐ	4.7 k	1/8W	composition
R97	1-246-794-00	Ⓐ	8.2 k	1/8W	
R98	1-246-795-00	Ⓐ	10 k	1/8W	
VR1,2	1-226-311-00	Ⓑ	20 k-A, variable; VR1 TONE, VR2 VOLUME		

SWITCHES

S1	1-552-486-00	Ⓔ	Pushbutton, BAND SELECTOR
S2	1-552-487-00	Ⓓ	Pushbutton, POWER
S3	1-552-370-00	Ⓑ	Slide, 24H/12H
S4	1-516-870-00	Ⓑ	Slide, ALARM, RADIO, BUZZER, TIME SIGNAL
S6	1-552-539-00	Ⓑ	KEY-BOARD, FREQUENCY
S7–9 S11–13			included in clock block
S14	1-552-539-00	Ⓑ	KEY-BOARD, CLOCK
S10,15	3-848-708-00	Ⓑ	Spring, TIME SET, LIGHT

MISCELLANEOUS

ANT	1-501-189-00	Ⓜ	Antenna, telescopic; FM
BPF	1-231286-00	Ⓑ	Filter, bandpass
J1,2	1-507-398-00	Ⓐ	Jack, mini, REC EARPHONE
J3	1-507-459-00	Ⓑ	Jack DC IN 3 V
MF1	1-409-325-00	Ⓒ	Filter, mechanical
SP	1-502-717-00	Ⓘ	Speaker, 8Ω
	1-548-118-00	Ⓤ	CLOCK & COUNTER

ACCESSORIES & PACKING MATERIALS

Part No.	*Description*
1-504-059-11	Ⓒ Earphone, ME-20H
3-701-626-00	Ⓐ Bag, plastic
3-794-233-21	Leaflet (US model)
3-884-422-00	Ⓐ Sheet, protection
3-885-638-00	Ⓑ Cushion, right
3-885-639-00	Ⓑ Cushion, left
3-885-656-00	Ⓔ Carton
3-995-825-11	Ⓓ Manual, instruction (E, AEP model)
3-995-825-21	Manual, instruction (US model)

Sony Corporation

© 1979